

IN THE CLAIMS:

Please amend the claims as follows:

1. (Currently Amended) A mold apparatus forming at least one metal bump from solder paste for direct placement on bond pads on a secondary substrate for transferring saidthe solder paste to a contact pad of a substrate for heating during reflow into a solder ball, comprising:
a substrate having a substantially flat planar surface;
at least one cavity formed in saidthe surface of saidthe substrate, saidthe cavity having substantially the same dimensions as the at least one metal bump, saidthe at least one cavity having a shape of one of a trapezoidal shape, a hemispherical shape, rectangular shape, and a square shape forming a first shape of the solder paste substantially conforming to the shape of the cavity transferring the solder paste when slightly heated to saidthe secondary substrate substantially in the shape of the at least one cavity and a second shape when reheated during the reflow thereof substantially drawing into a spherical shape held together by the surface tension of the solder material forming an approximately spherically shaped solder ball on a bond pad of saidthe bond pads of saidthe secondary substrate; and
a release layer applied to saidthe at least one cavity minimizing the wetting of solder paste on the at least one cavity formed in saidthe surface of saidthe substrate during heating thereof from the heating of the substrate.
2. (Currently Amended) The mold apparatus according to claim 1, wherein saidthe release layer comprises a silicon oxide layer.
3. (Currently Amended) The mold apparatus according to claim 1, wherein saidthe release layer comprises a silicon nitride layer.
4. (Canceled)

5. (Canceled)

6. (Currently Amended) The mold apparatus according to claim 1, wherein ~~said~~the at least one cavity has a depth in ~~said~~the surface of ~~said~~the substrate of about 28 micrometers.

7. (Currently Amended) The mold apparatus according to claim 1, wherein ~~said~~the release layer has a thickness ranging from about 200 Angstroms to 5 micrometers.

8. (Currently Amended) The mold apparatus according to claim 1, wherein ~~said~~the at least one cavity has a trapezoidal shape.

9. (Currently Amended) The mold apparatus according to claim 1, wherein ~~said~~the at least one cavity has a hemispherical shape.

10. (Currently Amended) The mold apparatus according to claim 1, wherein ~~said~~the at least one cavity has a rectangular shape.

11. (Currently Amended) The mold apparatus according to claim 1, wherein ~~said~~the at least one cavity has a square shape.

12. (Currently Amended) The mold apparatus according to claim 1, further comprising:
at least one heating strip located on another surface of ~~said~~the substrate.

13. (Currently Amended) The mold apparatus according to claim 1, further comprising:
a plurality of heating strips located on another surface of ~~said~~the substrate.

14. (Original) The mold apparatus according to claim 12, further comprising:
an electrical conductor connected to a portion of the at least one heating strip.

15. (Original) The mold apparatus according to claim 13, further comprising:
an electrical conductor connected to a portion of the plurality of heating strips.

16. (Currently Amended) The mold apparatus according to claim 1, wherein ~~said~~the
substrate comprises semiconductor material.

17. (Currently Amended) The mold apparatus according to claim 1, wherein ~~said~~the
substrate comprises ceramic material.

18. (Currently Amended) A solder mold apparatus forming at least one metal bump
from solder paste for direct placement on a corresponding bond pad on a secondary substrate,
comprising:

a substrate having a surface;

at least one cavity formed in ~~said~~the surface of ~~said~~the substrate, ~~said~~the cavity having

substantially the same dimensions as the at least one metal bump, ~~said~~the at least one
cavity having a shape of one of a trapezoidal shape, a hemispherical shape, rectangular
shape, and a square shape forming a first shape of the solder paste substantially
conforming to the shape of the cavity when slightly heated during transfer to ~~said~~the
secondary substrate substantially in the shape of the at least one cavity and forming a
second shape when reheated during the reflow thereof substantially drawing into a
spherical shape held together by the surface tension of the solder material forming an
approximately spherically shaped solder ball on a bond pad of ~~said~~the bond pads of
~~said~~the secondary substrate;

a layer applied to ~~said~~the at least one cavity minimizing the wetting of solder paste on the at least
one cavity formed in the surface of the substrate during heating thereof to

remove the solder paste from the substrate after the heating thereof; and
a metal paste applicator.

19. (Currently Amended) The solder mold apparatus according to claim 18, wherein ~~said~~the layer comprises a silicon oxide layer.

20. (Currently Amended) The solder mold apparatus according to claim 18, wherein ~~said~~the layer comprises a silicon nitride layer.

21. (Canceled)

22. (Canceled)

23. (Currently Amended) The solder mold apparatus according to claim 22, further comprising a metal paste dispenser, coupled to ~~said~~the metal paste applicator, to place a metal paste on ~~said~~the substrate.

24. (Currently Amended) The solder mold apparatus according to claim 23, further comprising a heating element to melt ~~said~~the metal paste to form a contact for application to ~~said~~the secondary substrate.

25. (Currently Amended) The solder mold apparatus according to claim 18, wherein ~~said~~the at least one cavity has a depth in ~~said~~the surface of ~~said~~the substrate of about 28 micrometers.

26. (Currently Amended) The solder mold apparatus according to claim 18, wherein ~~said~~the layer has a thickness ranging from above 200 Angstroms to 5 micrometers.

27. (Currently Amended) The solder mold apparatus according to claim 18, wherein ~~said~~the substrate comprises semiconductor material.

28. (Currently Amended) The solder mold apparatus according to claim 18, wherein ~~said~~the substrate comprises a ceramic material.

29. (Currently Amended) A mold apparatus forming at least one metal bump from solder paste with a width and a length for direct placement on bond pads on a secondary substrate, comprising:

a substrate having a surface; at least one cavity formed in ~~said~~the surface of ~~said~~the substrate, ~~said~~the at least one cavity having a selected width and a selected length in ~~said~~the surface, ~~said~~the selected width and ~~said~~the selected length being substantially the same as ~~said~~the width and length of the at least one metal bump, ~~said~~the at least one cavity having a shape of one of a trapezoidal shape, a hemispherical shape, rectangular shape, and a square shape forming a first shape of the solder paste substantially conforming to the shape of the cavity transferring the solder paste when slightly heated to ~~said~~the secondary substrate substantially in the shape of the at least one cavity and a second shape when reheated during the reflow thereof for substantially drawing into a spherical shape held together by the surface tension of the solder material to form an approximately spherically shaped solder ball on a bond pad of ~~said~~the bond pads of ~~said~~the secondary substrate; and a layer applied to ~~said~~the at least one cavity minimizing the wetting of solder paste on the at least one cavity formed in ~~said~~the surface of ~~said~~the substrate during heating thereof by the heating of the substrate removing the solder paste therefrom.

30. (Currently Amended) The mold apparatus according to claim 29, wherein ~~said~~the layer comprises a silicon oxide layer.

31. (Currently Amended) The mold apparatus according to claim 29, wherein ~~said~~the layer comprises a silicon nitride layer.

32. (Canceled)

33. (Canceled)

34. (Currently Amended) The mold apparatus according to claim 29, wherein ~~said~~the at least one cavity has a depth in ~~said~~the surface of ~~said~~the substrate of about 28 micrometers.

35. (Currently Amended) The mold apparatus according to claim 29, wherein ~~said~~the layer has a thickness ranging from about 200 Angstroms to 5 micrometers.

36. (Currently Amended) The mold apparatus according to claim 29, wherein ~~said~~the selected width and ~~said~~the selected length are substantially the same.

37. (Currently Amended) The mold apparatus according to claim 29, wherein ~~said~~the selected width is smaller than ~~said~~the selected length.

38. (Canceled)

39. (Currently Amended) The mold apparatus according to claim 29, further comprising:
at least one heating strip located on another surface of ~~said~~the substrate.

40. (Currently Amended) The mold apparatus according to claim 29, further comprising:
a plurality of heating strips located on another surface of ~~said~~the substrate.

41. (Currently Amended) The mold apparatus according to claim 29, wherein ~~said~~the substrate comprises semiconductor material.

42. (New) An intermediate solder ball forming apparatus comprising:
a mold substrate comprising;
 an upper surface,
 a lower surface, and
 at least one cavity formed in the lower surface of the substrate having a layer having a
 first degree of wettability relative to solder paste;
a carrier substrate disposed below the mold substrate comprising:
 a surface abutting the lower surface of the mold substrate, and
 at least one bond pad disposed on the surface of the carrier substrate below the at least
 one cavity formed in the lower surface of the mold substrate, the at least one bond
 pad having a second degree of wettability relative to solder paste that is greater
 than the first degree of wettability of the layer of the at least one cavity; and
solder paste disposed within the at least one cavity adjacent the layer thereof, gravity acting on
 the solder paste moving it from the layer of the at least one cavity to the bond pad
 disposed on the carrier substrate.